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Identifying Whether The Mystery Man or Elimination Lineup

Method is Most Effective For Children

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Abstract

Two distinct lineup methods have been developed in accordance with differing explanations for children's poor performance in target-absent situations, the mystery man and elimination lineup. The current study directly compared children's eyewitness accuracy between these two lineup methods in target-absent situations. It was hypothesized that children administered the mystery man lineup would respond with more accuracy than children given the elimination lineup. Twenty children between 39 to 65 months were exposed to a male confederate, then randomly administered either lineup method. Contrary to the hypothesis, there was no significant difference in accuracy between children administered the mystery man lineup, and those given the elimination lineup. However, the observed pattern was in the predicted direction. Future research should replicate the experimental design utilizing a larger sample size.

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Child Witnesses and Testimony In The Legal System

In some criminal cases, children may be the only witness to the crime. In such cases, children will likely be required to provide legal testimony, or at the very least give information to the police investigation. Indeed, a sizable number of children are called to testify in court (Bruck & Ceci, 1999). Children will also presumably be asked to identify the perpetrator or criminal who they observed commit the crime. Therefore judges, jurors, and police investigators need to be aware of children's accuracy at identifying individuals they have seen, particularly in methods used during forensic investigations. A technique often employed by police investigators when working with an eyewitness is a photographic lineup.

Target-Present Versus Target Absent Lineup Conditions

In a lineup, an eyewitness is presented with numerous photographs of individuals, and asked to identify the offender. In every forensic lineup procedure, there is one of two situations. In a target-present lineup, a photograph of the actual person the eyewitness saw commit the crime is present and amongst the possible choices given to the witness in the lineup. To make the correct decision in this situation witnesses must properly select the individual they saw during the crime from the presented lineup. This is a correct identification. When the witness selects an incorrect person from a target-present lineup (someone other than the culprit), they have committed a false identification. If the witness wrongly dismisses a target-present lineup, expressing the individual they saw commit the crime is not there, it is an incorrect rejection.

Alternatively, in a target-absent lineup, the culprit is not in the photographs presented, and is therefore not an available selection from the lineup. To make the correct decision when the culprit is missing from the lineup, witnesses must convey that they do not see the person they observed committing the crime in the presented photographs. This response is known as a correct rejection. Instances where the witness mistakenly selects an individual from target-absent lineups are known as false identifications.

Real-World Significance of Target-Absent Lineups

In forensic lineups, there are two types of errors that an eyewitness can commit: false identifications, and incorrect rejections. In target-absent situations, the only error that can be made is a false identification. False identifications are considered to be more detrimental than incorrect rejections, as an innocent person may be wrongfully accused of the crime, while the actual perpetrator will remain free. Additionally, the real criminal will likely be unsought by the police, as they will be focusing their efforts on the incorrectly identified individual (Malpass & Devine, 1981; Pozzulo & Lindsay, 1999). Therefore, as false identifications occur more frequently in target-absent than target-present situations, research focusing specifically on situations where the actual criminal is not in the lineup is of utmost importance (Havard & Memon, 2012).

In a typical lineup, witnesses are presented with a number of photographs at once, and are asked to select the culprit if they see him or her. This is known as a simultaneous lineup. In such a lineup, witnesses rely on relative, comparison-based judgments to identify the offender. False identifications in lineups have been reduced in adult eyewitnesses by altering the manner in which photographs are presented. In a sequential lineup, witnesses view one photograph after

another. For each photograph presented, the witness is asked if this is the culprit. In a sequential lineup, individuals should rely on ultimate, yes or no judgments to make decisions about the presented photographs. It has been repeatedly demonstrated that adults administered a sequential lineup respond with significantly less false identifications than those presented with a simultaneous lineup method. Unfortunately, children seem to respond with more false identifications when given a sequential lineup compared to one that is simultaneous (Lindsay & Wells, 1985; Pozzulo & Lindsay, 1998).

In further attempts to decrease false identifications in target-absent situations, researchers have also tried manipulating the instructions that witnesses receive prior to being administered lineups. Explicitly informing the witness that the culprit may not be present in the lineup, and explaining that they have the option to reject the lineup if they do not see the culprit has been found to be effective in decreasing incorrect responses. This finding has been demonstrated in both children and adults (Pozzulo & Dempsey, 2006; Steblay, 1997).

Children Versus Adults

Children's lineup performance has been directly compared to that of adults (Lindsay, Pozzulo, Craig, Lee, & Corber, 1997; Pozzulo & Balfour, 2006; Pozzulo & Warren, 2003). In target-present situations, it has been repeatedly demonstrated that children's accuracy at correctly selecting the target from the available options is comparable to that of adults (Lindsay et al., 1997; Pozzulo & Balfour, 2006; Pozzulo & Lindsay, 1999). Lindsay and colleagues (1997) found that both younger children, between the ages of 8 and 10, and older children, between the ages of 11 and 15 were just as accurate as adults in lineups that had the target present.

A large distinction has been observed however, between children's and adults' performance in target-absent lineups. Multiple studies have found children commit a much larger amount of false identifications compared to adults when given target-absent lineups, therefore performing with less accuracy (Humphries, Holliday, & Flowe, 2012; Lindsay et al., 1997; Pozzulo & Warren, 2003). For example, Lindsay and colleagues (1997) found adults were able to correctly reject a target-absent lineup 66 % of the time. In contrast, children between the ages of 8 and 10 were able to express the target was not in the lineup less than 30 % of the time. Clearly, children are worse than adults at correctly identifying that the target is not present in the given lineup.

There have been two alternative methods of lineups introduced that attempt to increase children's accuracy in target-absent situations, without interfering with their strong performance in target-present situations. These two methods are known as the "mystery man" and "elimination" lineups, and each deal with a different explanation for children's high rates of false identifications in target-absent lineups (Pozzulo & Lindsay, 1999; Zajac & Karageorge, 2009).

Cognitive Explanation

A cognitive explanation has been given for children's poor performance in lineups that do not have the target present, committing more false identifications than correct rejections. There are two general types of judgments. Absolute judgments are ultimate, yes or no decisions. Relative judgments in contrast, are comparative, respective processes that are more dimensional and continuum-based (Pozzulo & Lindsay, 1999). In target-present lineups, employing a relative judgment often produces correct identifications, as the person who looks relatively most like the criminal should indeed be the criminal. This explains why children do well in target-present

lineups, as they are relying on comparative judgments. However, in target-absent situations, utilizing a relative judgment will result in a false identification, as one will simply select the individual who looks most like the target. Therefore, eyewitnesses need to use absolute rather than relative judgments in target-absent situations to recognize that the target is not in the lineup (Pozzulo & Lindsay, 1999).

As previously mentioned, adults can be made to use absolute judgment through sequential presentation of the lineup, presenting the witness with individual photographs one at a time. Administering sequential lineups to adults has been demonstrated to significantly increase their correct rejection rate in target-absent lineups compared to simultaneous presentation of the photographs (Lindsay & Wells, 1985). With children however, sequential lineups do not elicit these absolute judgments, as they still seem to guess. Children respond with significantly more false identifications in both target-absent and target-present situations when given sequential lineups compared to simultaneous lineups (Pozzulo & Lindsay, 1998).

Elimination Lineup

In a lineup method known as the elimination technique, children must make an initial relative judgment by selecting who looks most like the target. After this, they are asked whether their selection is or is not the target. Children have to make an absolute judgment to decide whether this person is whom they initially saw. The fact that the nature of the elimination procedure requires children to make an absolute judgment explains why this lineup method has been observed to greatly increase children's correct rejection rate in target-absent lineups (Pozzulo & Lindsay, 1999).

Pozzulo and Lindsay (1999) had children between 10 and 14 years of age view a videotape of a male confederate explaining how to play safely. After viewing this, the children were given 20 minutes of filler tasks, then presented with a lineup. Children in the simultaneous lineups were shown six photographs at once. Before being shown the lineup, they were told that the target may or may not be one of the possible choices. They were asked to make a selection from the photographs if they saw the target, and to tell the experimenter if they did not see him. Children in the elimination lineup were presented with the same six photographs, but were first instructed to choose the person they felt looked most like the confederate from the video. Upon making this selection, all other photographs were removed from the children's view. They were then asked to ultimately decide whether this was or was not the target, and had to respond with either "yes" or "no."

The researchers found that when the target was present, the elimination and simultaneous lineups did not vary in terms of correct identifications (Pozzulo & Lindsay, 1999). In contrast, children presented with the elimination lineup were able to correctly reject the target-absent lineups 73% of the time, while merely 54% of children in the simultaneous lineup were able to do so. The elimination method strengthened children's correct rejections when the target was not in the lineup, while maintaining children's ability to positively identify targets when they are present.

As the initial elimination lineup study was done with older children, Pozzulo, Dempsey, and Crescini (2009) wanted to replicate the earlier study's findings with children between 3 and 6 years of age. These researchers had children participate in a mask-making activity that was facilitated by an unfamiliar female confederate. Thirty minutes after finishing their craft, the

children were administered a lineup that was either a simultaneous control procedure, or an elimination method.

As expected, there was no difference between the control and elimination procedure in children's ability to identify the target when she was present in the lineup. However, more children in the elimination lineup were able to correctly reject the lineup when the target was absent compared to children in the simultaneous lineup, a difference of 28%. Even with children who are preschool age, the elimination lineup demonstrated an increase in the likelihood of making a correct rejection in target-absent lineups, without a decline in correct identifications when the target was present in the lineups (Pozzulo et al., 2009).

Social Explanation

In opposition to the cognitive explanation for children's poor performance in target-absent situations, a social explanation has been given. It has been suggested that merely presenting children with a lineup pressures them socially to make a choice from the available lineup members (Beal, Schmitt, & Dekle, 1995). Havard and Memon (2013) have also highlighted that the responses for a rejection and identification are dissimilar. Identifications require the witness to actively participate and make a selection from the lineup, identifying that they do see the target. This is a positive response. In comparison, to make a rejection, a witness conveys that they do not see the target, which is a negative response.

Mystery Man Lineup

Zajac and Karageorge (2009) have proposed that children perceive positive responses to be more favourable than negative responses. This explains why children are more likely to choose from a lineup than reject it. Presenting children with an alternative "not here" option to

select from the lineup has been suggested. By providing children with this option, it shifts the response of a rejection to be the same as identification. The child is simultaneously making a choice from the lineup while still expressing that they do not see the target. The mystery man, a silhouette with a question mark, has been used with children as an alternative to selecting a person from the lineup. The mystery man alters rejecting the lineup to be a positive response rather than one that is negative.

Zajac and Karageorge (2009) had children between 8 and 11 years of age participate in a field trip to a police station, where a male officer lead them on a tour. During the tour, the policeman brought the children into a room, and gave a speech on the role of police officers. Halfway through the speech, a male confederate interrupted, by walking into the room, and asking the officer for his keys to a room down the hall. Upon receiving the keys, the confederate made some verbal remarks, then left the room. The children then finished their field trip by doing activities around the station, then went home. The following day at school, they were presented with lineups. Children were randomly assigned to one of two lineups: a simultaneous lineup or an experimental mystery man lineup. In the simultaneous lineup, children were shown a simultaneous lineup, consisting of six different male photographs. Before being presented the lineup, children in the control condition were told that the man who had interrupted the police officer the day before may or may not be in the photographs that they were to be shown. If the children saw the target in the photographs, they were to point to his picture. If they did not see the target however, children were asked to verbally express this to the experimenter.

Children in the mystery man lineup were given the same six-person simultaneous lineup as the control, but had an additional picture depicting a male silhouette with a question mark

over his face, the “mystery man.” The children in the mystery man lineup were also given the same instructions as those in the simultaneous lineup, but were told to point to the mystery man if they did not see the target (Zajac & Karageorge, 2009).

Zajac and Karageorge (2009) found that children's accuracy in target-present lineups did not differ between the two lineup procedures. Children in both the simultaneous and mystery man lineups were able to correctly identify the male confederate about 75% of the time. However, in situations where the target was not present, there was a significant difference between children's responses in the two methods. Children in the mystery man lineup were able to correctly reject the lineup 71% of the time, compared to 46% of the children in the simultaneous lineup. Evidently, the mystery man lineup is able to increase the accuracy of children's responses in target-absent situations, without interfering with their strong performance in instances where the target is present.

In similar research, Havard and Memon (2013) had both young children, between 5 and 7 years of age, and older children, 8- to 11-year-olds, view a video of a male confederate enter an office, search through his desk, then exit into a hallway. The children were then presented with video lineups, as videos rather than photographs are utilized in UK forensic procedures. Children were randomly assigned to either a sequential lineup, or experimental mystery man lineup. In the sequential lineup, children were told that they would be shown nine videos one after another, and that the target they had been exposed to may or may not be in the videos. If the children saw the confederate they were told to select his video. If not, they were to verbally convey that the target was not present. In the mystery man lineups, one of the nine videos shown to the children was of a male silhouette with a question mark, created with imaging software. Children in the mystery

man lineup were told the same instructions as those in the sequential lineup, except asked to select the mystery man if they did not see the target.

Havard and Memon's (2013) results were consistent with those of Zajac and Karageorge's (2009). In the younger children, there was no significant difference between the mystery man and sequential lineups when the target was present. However, in target-absent situations, a significant difference was observed. Children in the sequential lineup were only able to correctly reject the lineup 29% of the time, in stark contrast to the 68% of children given a mystery man lineup. The same pattern was visible with the older children, as no difference occurred between the conditions when the target was present. However, those in the mystery man lineup performed with significantly more accuracy than the children in the sequential lineup. As demonstrated previously, presenting children with the mystery man lineup increased their correct rejection rate in situations where the target was not in the lineup, without inhibiting the amount of correct-identifications in target-present situations (Havard & Memon, 2013).

Current Forensic Issue

In a current forensic context, researchers do not have a consistent recommended lineup technique for use with child eyewitnesses. Both forms of lineups have been empirically demonstrated to increase children's ability to make correct rejections in target-absent situations, without hindering their capacity to correctly identify culprits in target-present situations. It is presently unclear which lineup method is best at increasing children's performance in target-absent situations, as both the mystery man and elimination techniques are relatively new. It is therefore up to the police officer's discretion to decide which lineup procedure to employ, creating an unstandardized process.

Current Study, Variables, and Hypothesis

The current study attempted to address the issue of which lineup procedure to use with child eyewitnesses in forensic contexts by directly comparing children's accuracy in the mystery man and elimination methods. As it had been consistently demonstrated that neither of these lineups influence target-present situations, none of the lineups in this study had the target available from the possible choices (Havard & Memon, 2013; Pozzulo et al., 2009; Zajac & Karageorge, 2009). Children were randomly administered either the mystery man or elimination lineup. Children's eyewitness accuracy was examined, which was operationalized as the percentage of children who were able to correctly reject the lineup.

An extensive review of the current literature was conducted to analyze the actual increase in response accuracy over control lineups for both the mystery man and elimination lineup procedures (Davies, Tarrant, & Flin, 1989; Dunlevy & Cherryman, 2013; Havard & Memon, 2013; Humphries, Holliday, & Flowe, 2012; Pozzulo & Balfour, 2006; Pozzulo & Lindsay, 1999; Pozzulo et al., 2009; Zajac & Karageorge, 2009). Previous research demonstrates a larger increase over control lineups for the mystery man method compared to the increase over control lineups for the elimination method. As such, it was hypothesized that children administered the mystery man lineup would demonstrate significantly more correct rejections than those given the elimination lineup.

Methods**Participants**

Participants were 20 preschool and kindergarten children, sampled from a preschool. Eleven of the children were male. The age range of male children was between 39 and 65

months, with an average age of 51 months ($SD = 8.10$). The age range of female participants was between 35 and 55 months, with an average age of 48 months ($SD = 7.04$). The author met with the school's Director to gain approval for the project to be conducted. A description of the proposed study, approved ethics form, and proposed age of child participants was given to the Director. Once the study was approved, consent letters were sent home to parents of children in preschool and kindergarten classes. Twenty-seven children's parents had given consent. Seven children were absent on data collection days, and were not included in the final sample.

Materials

Lineups were constructed using colour photographs taken from the AR Face Database (Martinez & Benavente, 1998). Photographs were 170 x 240 pixels, and 5cm x 8 cm in size. All lineups consisted of six colour photographs in a 2x3 arrangement. The foils that were chosen resembled the male confederate that the children would be exposed to. Six foils with short, brown hair, brown eyes, and a blank facial expression were used. Location of the foils and mystery man were randomly decided.

All lineups were target-absent, and presented on a 13.3inch laptop screen. Twelve different lineups were utilized in total, six mystery man lineups and six elimination lineups. The elimination lineups consisted of six photographs of foils. The same six photographs were used in each version, but placed in randomized locations. The mystery man lineups consisted of five foil photographs, along with one photo of a black silhouette with a question mark - the mystery man. Each version of the mystery man lineup had the mystery man placed in a different location, with the five foil photographs randomly selected from the six foils utilized in the elimination lineups.

The five foils were given a randomized location. Individual colour photographs of each foil as well as the mystery man were utilized, printed out on 8.5" x 11" paper.

Children were given a simple oral debriefing at the time of the experiment. A basic debriefing sheet was sent home with the children to their parents that indicated where in the school the child worked with the researcher, how long the child worked with the researcher for, and a brief description of what the researcher and child did together. Later in the year, the University Lab School will publish a newsletter for parents of the students which has an abstract for each study that was conducted at the school that year. Children were exposed to a live human target, who gave a science demonstration using rocks, water, and a plastic bowl.

Procedure

On the day of the lineup administration, a male confederate visited the classroom, and introduced himself as "Professor Rocks." The male confederate gave a five-minute science presentation about rocks and minerals, where children were shown different rocks which sank and floated in the water. After giving his demonstration, "Professor Rocks" thanked the children and left the classroom. Fifteen minutes after "Professor Rocks" left the classroom, children were given their free time to play. The research assistant individually led the children out of the classrooms by asking if they wanted to play a game. They were then individually administered the lineups in one of the testing rooms at the school. Children were randomly assigned to either the mystery man or elimination lineup method.

In the mystery man lineups, children were individually shown the lineup of 5 foil photographs plus the mystery man on a laptop. The children were told by the research assistant

that "Professor Rocks" may or may not be in the photos, and were asked to point to the picture of "Professor Rocks" if they saw him, but to point to the "question mark" if they did not. Once they made their selection, the research assistant recorded the lineup method, who the child pointed to, and gave the child their verbal debrief. The children were then walked back to their class, where the next participant was selected. In the mystery man condition, children's responses were considered correct rejections if they pointed to the mystery man. Children's responses were considered false identifications if they pointed to one of the five foil photographs.

In the elimination lineups, the research assistant presented children with a lineup consisting of 6 foil photographs on a laptop, and told that "Professor Rocks" may or may not be in one of the pictures. First, children were asked to point to who they thought looked the most like "Professor Rocks." Once they had done this, the laptop was closed, and the research assistant showed children the individual photograph of the person they had selected. The children were then asked if who they selected was really "Professor Rocks." After they had responded, the lineup method, child's initial selection, and final yes or no decision was recorded. Children were given their verbal debrief, and lead back to the classroom, where the research assistant selected the next child. In the elimination method, children's responses were considered correct rejections if they had ultimately decided that it was not "Professor Rocks" in the picture when posed this second question. In contrast, children's responses were considered false identifications if they believed that their initial selection was indeed "Professor Rocks."

Results

To examine if children given the mystery man lineup performed with greater accuracy than children given the elimination lineup, a Fisher's exact test was performed comparing the

frequencies of correct rejections in both lineup methods. Overall, 27% of the children given the elimination lineup responded with a correct rejection, while 66% of the children given the mystery man lineup responded with a correct rejection, a difference that was not statistically significant ($p = .095$, *Fisher's exact test*). Children given the mystery man lineup performed no more accurately than children given the elimination lineup, although the observed pattern was in the hypothesized direction (see Table 1).

The validity of the lineups was then analyzed. To examine if each position in the lineup had been selected an even amount of times, a goodness of fit chi square was performed on the location of photographs that children had selected. The analysis revealed that all locations were evenly selected by the children $\chi^2(5, n=20) = 1.0$, *ns*. There was not a position that was selected more than the others. To investigate if all foil photographs were selected an equal number of times, a second goodness of fit chi square was conducted on the foil photograph selections done by children in the first step of the elimination lineups. Some foils were selected more than others, although the difference was not statistically different, $\chi^2(5, n=11) = 2.05$, *ns*.

Table 1

Children's Responses by Lineup Type

Lineup Type	Response		Total
	Correct Identification	Correct Rejection	
Mystery Man	3	6	9
Elimination	8	3	11

Discussion

Interpreting the Results

Currently, there is not a consistent lineup method that is administered to child eyewitnesses in forensic proceedings. Thus, it is up to the police officer's discretion as to which lineup procedure to utilize with children, creating an unstandardized process. This study aimed to examine this issue by directly comparing children's responses in the mystery man and elimination lineup methods in target-absent situations, to see if one lineup elicits more accurate responses than the other. It was hypothesized that children given the mystery man lineups would respond with more accuracy than children administered elimination lineups.

Contrary to the hypothesis, there was no significant difference between the two lineup methods. Children who were shown the mystery man lineup made no more correct rejections than children who were given the elimination lineup, although the pattern was in the predicted direction. The current study's results do not suggest that one lineup should be utilized over the other.

Children who participated in the study were quite young, between 39 and 65 months old, or 3 and 6 years. In previous research utilizing the mystery man lineup, the participating children were older than those in the current study. In Zajac and Karageorge's (2009) experiment comparing mystery man and simultaneous lineups, children were between 8 and 11 years of age. Havard and Memon (2013) administered children simultaneous and mystery man video lineups, however their participants were children ranging from 7 to 11 years old. Pozzulo and Lindsay's (1999) initial experiment with the elimination lineup had children who were between 10 and 14 years of age. The majority of previous research on mystery man and elimination lineup methods

has been conducted on older children than those sampled in the current study. As over half (66%) of the children administered the mystery man lineup responded with a correct rejection, it seems that even with young children, this lineup method is quite effective for target-absent situations. However, as the difference in correct rejections between the mystery man and elimination lineup was not significant, this finding must be interpreted with caution. Future research should continue to utilize similarly aged children to further investigate the possibility that even young children respond with more accuracy when given the mystery man lineup compared to the elimination lineup.

Why The Difference Was Hypothesized

There were various reasons why it was hypothesized that children given the mystery man lineup would respond with a greater number of correct rejections than those administered the elimination lineup. To begin, there are two different theoretical explanations for children's poor performance in target-absent situations. The mystery man lineup is associated with the social explanation for children's inaccuracy when the culprit is not in the lineup. Beal, Schmitt, and Dekle (1995) have proposed that the mere presentation of a lineup will cause children to feel socially constrained to select someone from the possible choices, even if they don't see the target. Furthermore, identifications are positive social responses, while rejections are negative (Havard & Memon, 2013).

It has been suggested that children have a more favourable perception of positive responses compared to negative responses (Zajac & Karageorge, 2009). The mystery man allows children to engage in the lineup by selecting a photograph, while simultaneously conveying that they do not see the target. This shifts the response of rejecting the lineup to be positive, rather

than negative, which should increase the likelihood of children responding to target-absent lineups with correct rejections.

In contrast to the mystery man lineup, the elimination method is associated with the cognitive explanation for children's poor performance in target-absent lineup situations. The cognitive explanation concerns absolute and relative judgments that humans make. According to this explanation, children's performance is not accurate in target-absent lineups because they rely on relative judgments, rather than employing an absolute judgment. As the nature of the elimination lineup requires children to make an absolute judgment, they should be less likely to incorrectly respond with a false identification, increasing their ability to correctly reject the lineup (Pozzulo, Dempsey, & Crescini, 2009).

There are a variety of theoretical issues with the elimination lineup. Although the elimination lineup requires children to perform an absolute judgment by asking them a yes or no question, the issue of acquiescence is not solved. It is likely that children will still perceive answering "no" (a negative response) to be less favourable than if they say "yes" (a positive response) when asked to ultimately decide if their initial selection is or is not the target. Because they view the negative response as less desirable than positive responses, children are still likely to respond with a "yes" decision, even if they are aware that this is not the target.

Additionally, an absolute judgment may very well be necessary to complete an elimination lineup. However, it is unclear whether children's absolute decisions are accurate or not. There is still a possibility that the child witness will ultimately decide that the target is indeed the person who they initially selected, even though it is not. Although the child will not

be able to make a relative judgment, this does not increase the likelihood of absolute judgments being correct. Furthermore, the additional steps involved in an elimination lineup may confuse young children, causing them to simply agree when asked their ultimate yes/no decision.

Evidently, there are potential issues with the elimination lineups.

Finally, a review of previous research was conducted to analyze the actual increase in rejection accuracy compared to simultaneous lineups for both the mystery man and lineup procedures (Davies, Tarrant, & Flin, 1989; Dunlevy & Cherryman, 2013; Havard & Memon, 2013; Humphries, Holliday, & Flowe, 2012; Pozzulo & Balfour, 2006; Pozzulo & Lindsay, 1999; Pozzulo et al., 2009; Zajac & Karageorge, 2009). This examination revealed mystery man lineups to be demonstrating greater increases in accuracy over control lineups compared to the increases elimination lineups exhibited. It was therefore hypothesized that the children given mystery man lineups would provide more accurate responses compared to children administered elimination lineups.

Limitations of the Study

There were a number of limitations with the current study. To begin, the number of children who actually participated in the study was much less than desired. There were many parents of potential child participants who simply did not return the consent form sent home with their child from school. Of the 53 parents who were sent recruitment letters for their children to participate in the experiment, only 33 returned a letter, with 27 giving consent. On the days of data collection, many children were absent from class due to sickness or other commitments, leaving a mere 20 children who were administered lineups.

The small number of participants is problematic, as it made significant effects difficult to obtain. The observed frequencies of correct rejections were in the hypothesized direction, as 66% of children in the mystery man condition responded correctly, while only 23% of children administered the elimination lineup did so. However, because there were only 20 participants (9 administered the mystery man lineup and 11 administered the elimination lineup), this difference was not large enough to be statistically significant. A power analysis was run on the collected data revealing a significant effect would have been found with a larger n of 48 (Faul, Erdfelder, Lang, & Buchner, 2007). Thus, a replicated study should be conducted utilizing at least 50 child participants. Obtaining a larger sample size would also allow the interpretation of any results to be made with more confidence.

Furthermore, additional analyses conducted on the foil photographs revealed a potential bias in the lineup. Examining the data collected from the child participants given the elimination lineup, there was one foil photograph that was not selected by any of 11 the children. Although analysis revealed this difference to be insignificant due to the small number of participants, this potential bias was further investigated.

A researcher administered the foil photographs in a 2x3 lineup to an undergraduate psychology class. The students were asked to select who they thought was the scientist. If the foil photographs looked similar to each other, each photograph should have been selected an equal number of times. Analysis revealed that not all foils were selected evenly amongst the undergraduate class $\chi^2(5, n=39) = 62.08, p < .001$. This suggests that the foil photographs did not all look alike, decreasing the validity of the lineup. Examining the raw data, there was a coinciding trend between the children's selections and those of the undergraduate class. The foil

who was not selected at all by the children in the elimination lineup was only chosen once by the 39 undergraduate students. It is possible that children's responses to the lineup were skewed due to this biased lineup. In future research, manipulation checks should be utilized prior to administering the lineups to ensure that all foils have an equal likelihood of being selected, increasing the validity of any results.

The external validity of the current experiment could also be improved. In the majority of real forensic cases, children eyewitnesses are not administered photographic lineups until much after the crime has occurred. In the current study, children were given a lineup on the same day that they had been exposed to the target, no more than an hour after seeing a science demonstration. To be more similar to real-life forensic situations, the lineups could be administered to the child participants days or weeks after the target exposure, although this may decrease the accuracy of children's responses.

In future research, both target-absent and target-present lineups could be utilized. Previous research has repeatedly demonstrated that neither the mystery man nor elimination method increase children's accuracy compared to simultaneous lineups in target-present situations (Havard & Memon, 2013; Pozzulo & Lindsay, 1999; Zajac & Karageorge, 2009). However, since the two lineup methods have never been directly compared prior to this study, it is unknown if the mystery man or elimination method is more effective than the other such situations. Due to the small sample size and scope of the current study, target-present lineups were not included.

Final Words

In conclusion, children administered the mystery man lineup responded with no more

accuracy than children who were given the elimination lineup, contradicting the hypothesis.

Although the observed frequencies of correct rejections were in the predicted direction, the small number of participants led to a non-significant difference. The results do not suggest that one method of lineup procedure is more effective than the other when administering to child eyewitnesses. Future research utilizing a larger sample size needs to be conducted in order to have a deeper empirical understanding of whether the mystery man or elimination lineup elicits the most accurate responses for child eyewitnesses in forensic contexts.

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